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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,664	05/21/2004	Min-Hsun Hsieh	KYCP0009USA1	3663
27765	7590	09/22/2004	EXAMINER	
NAIPO (NORTH AMERICA INTERNATIONAL PATENT OFFICE) P.O. BOX 506 MERRIFIELD, VA 22116			DANG, TRUNG Q	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/709,664	HSIEH ET AL.	
	Examiner	Art Unit	
	Trung Dang	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al. (U.S. Pat. 6,709,883).

With reference to Figs. 1-3, the reference teaches the claimed invention in that it discloses a method for forming a light emitting diode (LED) comprising the steps of:

forming a first stack comprising forming LED epitaxial layers on a substrate 26; forming a second reaction layer over said first stack (Fig. 1 and col. 3, lines 1-7; col. 4, lines 1-6); forming a second stack comprises forming a

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transparent adhesive layer 14 of BCB or epoxy on a second transparent substrate 10 (Fig.2 and col. 3, lines 45-50); forming a first reaction layer over said second stack; holding together said first reaction layer and said second reaction layer by means of the transparent adhesive layer 14 (Fig. 3 and col. 4, lines 6- 9).

Noted that as disclosed in col. 4, lines 1-6, a layer of adhesion promoter is formed on the surface of the LED epitaxial structure stack of Fig. 1 (corresponding to the claimed first stack) and on the surface of the transparent substrate 10 of Fig. 2 (corresponding to the claimed second stack), hence the adhesion promoter layers respectively read on the claimed second reaction layer and first reaction layer.

For claim 11, see col. 3, lines 52-54 for the materials of the transparent substrate 10 (corresponding to the claimed second substrate).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being

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unpatentable over Lebby et al. (U.S. Pat. 5,358,880) in view of Yang as above.

Lebby et al. teach a method for forming a LED comprising the steps of:
forming a first stack composed of LED epitaxial layers, wherein the forming comprises following steps:

- providing a first GaAs substrate 12;
- forming a second contact layer 14 of GaAs on the first substrate;
- forming a second cladding layer 15 on the second contact layer;
- forming an emitting layer 16 on the second cladding layer;
- forming a first cladding layer 17 on the emitting layer;
- forming a first contact layer 18 of GaAs on the first cladding layer;
- forming a transparent conductive layer 20 of indium tin oxide (ITO) on the first contact layer;
- forming a second stack comprising forming a transparent adhesive layer 22 of epoxy on a second transparent substrate 25; and
- holding together said first stack and said second stack by means of the transparent adhesive layer 22 (Figs. 1-2 and related text).

Lebby et al. differs from the claims in not disclosing the steps of forming a second reaction layer over the first stack, forming a first reaction layer over the second stack, and holding together said first reaction layer and said second reaction layer by means of a transparent adhesive layer as recited in the pending claim 1.

Yang et al. teach that in order to improve the adhesion property between a LED epitaxial structure and a transparent substrate, a layer of adhesion promoter can be formed on the surface of the LED epitaxial structure and on the surface of the transparent substrate before a transparent adhesive layer is formed thereon (col. 4, lines 1-6).

It would have been obvious to one of ordinary skill in the art to modify Leiby's process by forming an adhesion promoter layer on the surface of the LED first stack (i.e., on the ITO layer 20) and on the surface of the transparent substrate 25 (i.e., between substrate 25 and adhesive layer 22) because the presence of the adhesive promoter layer such would enhance the adhesion between the LED first stack and the transparent substrate as suggested by Yang. Note that, the adhesion promoter layers formed the LED first stack reads on the claimed second reaction layer and the adhesion promoter layer formed on the surface of the transparent substrate 25 reads on the claimed first reaction layer. Accordingly, the two adhesion promoter layers are hold together by means of the transparent adhesive layer 22.

For claim 3, see Fig. 3 and col. 4, lines 54-55 for the removal of the first substrate 12. Also, see Fig. 4 for the etching of the second contact layer 14, the second cladding layer 15, the emitting layer 16, the first cladding layer 17, and the

first contact layer 18. See Fig. 6 for the forming of a first electrode 30 on the second contact layer 14, and a second electrode 32 on the transparent conductive layer 20.

For claims 5 and 6, although Lebby et al. disclose an AlGaAs LED, Yang et al. in column 3, lines 1-12 teach an AlGaInP LED that uses compound semiconductor materials for the contact layer, the first and second cladding layers, and the emitting layer as recited in the pending claims 5 and 6. Thus, it would have been obvious to one of ordinary skill in the art to use the compound semiconductor materials of the pending claims 5 and 6 for the aforementioned layers as taught by Yang et al. because it is known to use such materials in the fabrication of a LED device having a wave length of 635nm (Yang, col. 4, lines 33-34), and the employment of a known material to make the same would have been within the level of one skilled in the art.

4. Claims 8, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebby et al. taken with Yang et al. as applied to claims 1-7 and 9-11 above, and further in view of Yamazaki et al. (US 2001/0019244 A1).

The combination of Lebby et al. and Yang et al. teaches a method as described above. The combined teaching differs from the claims in not disclosing the material of the adhesion promoter layer as claimed. Yamazaki et al. teach that metal material including titanium (Ti) and chromium (Cr) is used to enhance the adhesive properties between a transparent substrate and an ITO transparent

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conductive layer (paragraph [0068]). It would have been obvious to one of ordinary skill in the art to use Ti or Cr for the adhesion promoter layer of the combined process because this would enhance the adhesion between the transparent substrate 25 and the ITO transparent conductive layer 20 of the LED structure depicted in Lebby's Fig. 6.

As for claims 12 and 13, since the materials for the first reaction layer, the second reaction layer, and the transparent adhesive layer taught in the combined teaching are identical with that of disclosed in the present invention, the mechanism by which the layers are bonded together must inherently be the same, absent evidence to the contrary.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is 571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Trung Dang
Primary Examiner
Art Unit 2823

09/16/04

A handwritten signature in black ink, appearing to read 'Trung Dang', written in a cursive style.